



US Army Corps of Engineers



Water Supply and Dam Safety

“Working Together for Safer Dams and Increased Water Supply”

Presentation to the Water Supply Workshop
2 June 2009, Tulsa, Oklahoma
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Corps Dam Safety Program Manager

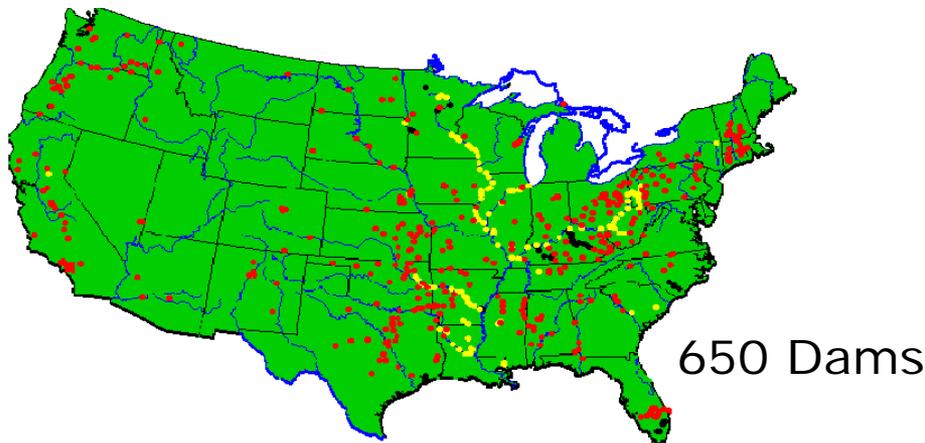


Agenda

- Program and Safety Environment
- Initiatives Integrated with Water Supply
 - Risk Management
 - Decision Making
 - Process
 - Competencies
 - Management
 - Policies

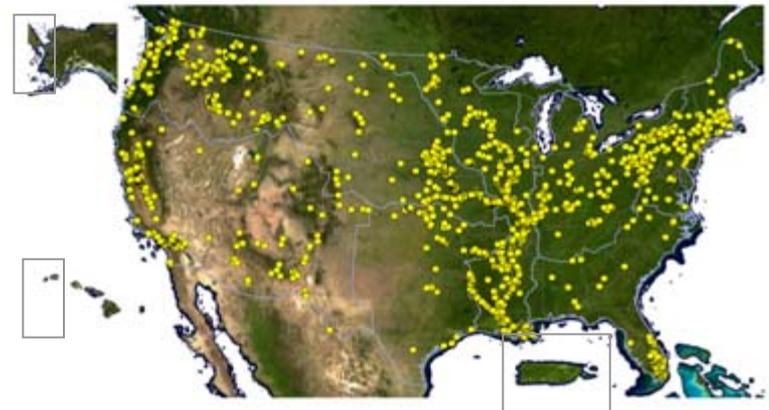


Current Safety Environment: State of Corps Infrastructure

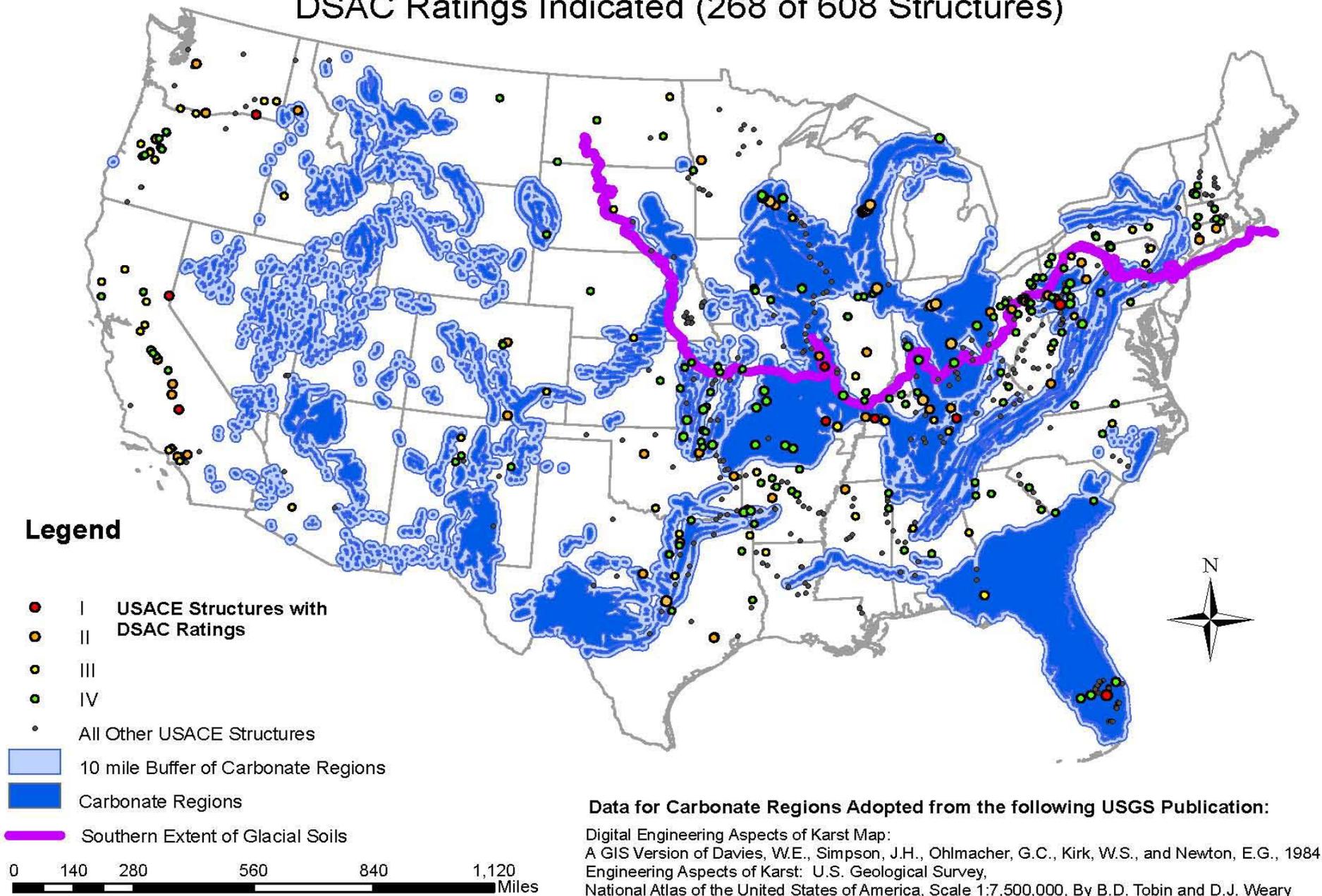


Infrastructure follows Floods,
People Follow Infrastructure

- Portfolio Stats:
 - Very Large
 - Aging (+50 years)
 - Relatively untested



USACE Structures with Carbonate and Glacial Soil Regions DSAC Ratings Indicated (268 of 608 Structures)



Legend

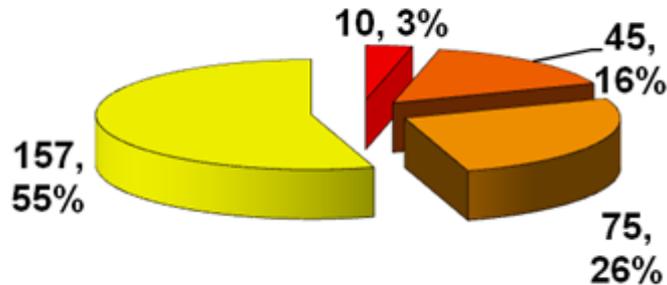
- I USACE Structures with DSAC Rating
- II
- III
- IV
- All Other USACE Structures
- 10 mile Buffer of Carbonate Regions
- Carbonate Regions
- Southern Extent of Glacial Soils

Data for Carbonate Regions Adopted from the following USGS Publication:
Digital Engineering Aspects of Karst Map:
A GIS Version of Davies, W.E., Simpson, J.H., Ohlmacher, G.C., Kirk, W.S., and Newton, E.G., 1984,
Engineering Aspects of Karst: U.S. Geological Survey,
National Atlas of the United States of America, Scale 1:7,500,000, By B.D. Tobin and D.J. Weary

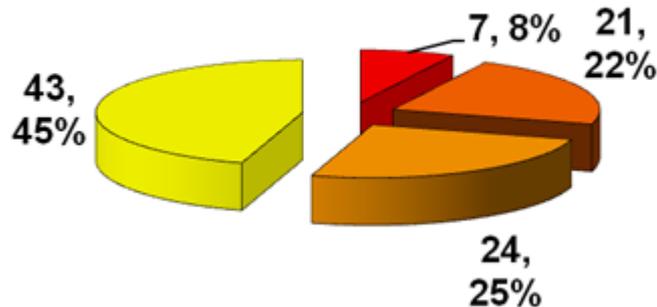


Corps of Engineers Dams

Flood Damage Reduction Dams
Through March 2009



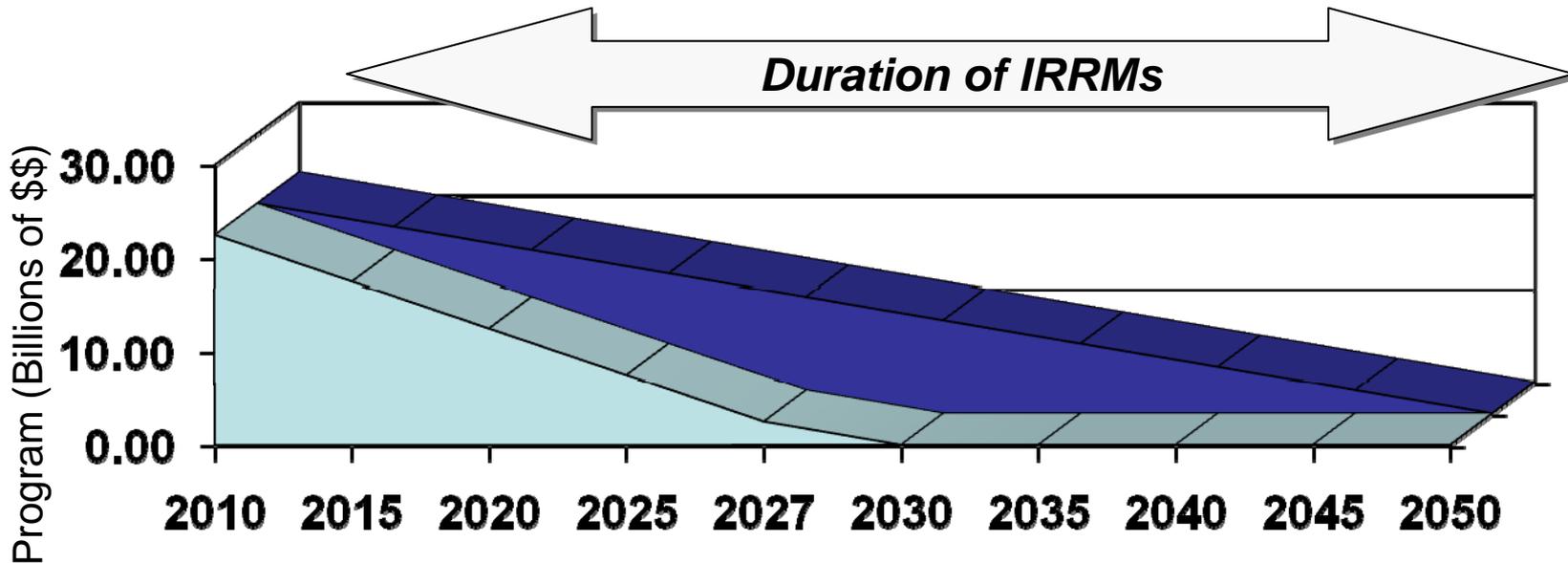
Navigation Dams
Through March 2009



- Program Findings 4 Years into Risk Informed Process:
 - Half of Portfolio is Actionable for Rehab
 - Potential Requirement Exceeds \$20B in Rehab
 - Currently \$500M/year Construction (9 Dams)
 - Engineering Requirement Exceeds \$65M/year (60 Dams)



Dam Safety Program Scenarios



*Assumes 75% percent of current DSAC Class I, II, and III Dams advance to construction at average cost of \$150M/rehabilitation.

■ Class I-III \$1B/year ■ Class I-III @ \$500M/yr

FOUO – Not for Public Release



Comprehensive Risk Framework





Management Initiatives: Principles of Decision Making

Old Approach

- Locally Led
- Locally Decided
- Balance Safety with Other Benefits
- First Come, First ...
- Politics Drive Decisions
- Every District for Themselves

New Approach

- Nationally Led
- Jointly Decided
- Safety Paramount
- Risk Informed
- Politics Supports Decisions
- Cooperation Key to Survival

USACE Dam Safety Action Classification Table*

Dam Safety Action Class	Characteristics of this class	Actions for dams in this class
I URGENT AND COMPELLING (Unsafe)	CRITICALLY NEAR FAILURE Progression toward failure is confirmed to be taking place under normal operations. Almost certain to fail under normal operations from immediately to within a few years without intervention. OR EXTREMELY HIGH RISK Combination of life or economic consequences with probability of failure is extremely high.	Take immediate action to avoid failure. Validate classification through an external peer review. Implement interim risk reduction measures, including operational restrictions, and ensure that emergency action plan is current and functionally tested for initiating event. Conduct heightened monitoring and evaluation. Expedite investigations to support justification for remediation using all resources and funding necessary. Initiate intensive management and situation reports.
II URGENT (Unsafe or Potentially Unsafe)	FAILURE INITIATION FORESEEN For confirmed (unsafe) and unconfirmed (potentially unsafe) dam safety issues, failure could begin during normal operations or be initiated as the consequence of an event. The likelihood of failure from one of these occurrences, prior to remediation, is too high to assure public safety. OR VERY HIGH RISK The combination of life or economic consequences with probability of failure is very high.	Implement interim risk reduction measures, including operational restrictions as justified, and ensure that emergency action plan is current, and functionally tested for initiating event. Conduct heightened monitoring and evaluation. Expedite confirmation of classification. Give very high priority for investigations to support justification for remediation.
III HIGH PRIORITY (Conditionally Unsafe)	SIGNIFICANTLY INADEQUATE OR MODERATE TO HIGH RISK For confirmed and unconfirmed dam safety issues, the combination of life or economic consequences with probability of failure is moderate to high.	Implement interim risk reduction measures, including operational restrictions as justified, and ensure that emergency action plan is current and functionally tested for initiating event. Conduct heightened monitoring and evaluation. Prioritize for investigations to support justification for remediation considering consequences and other factors.
IV PRIORITY (Marginally Safe)	INADEQUATE WITH LOW RISK For confirmed and unconfirmed dam safety issues, the combination of life or economic consequences with probability of failure is low and may not meet all essential USACE guidelines.	Conduct elevated monitoring and evaluation. Give normal priority to investigations to validate classification, but no plan for risk reduction measures at this time.
V NORMAL (Safe)	ADEQUATELY SAFE AND RESIDUAL RISK IS CONSIDERED TOLERABLE. Dam is considered safe, meeting all essential USACE guidelines with no unconfirmed dam safety issues.	Continue routine dam safety activities, normal operation, and maintenance.

General Description

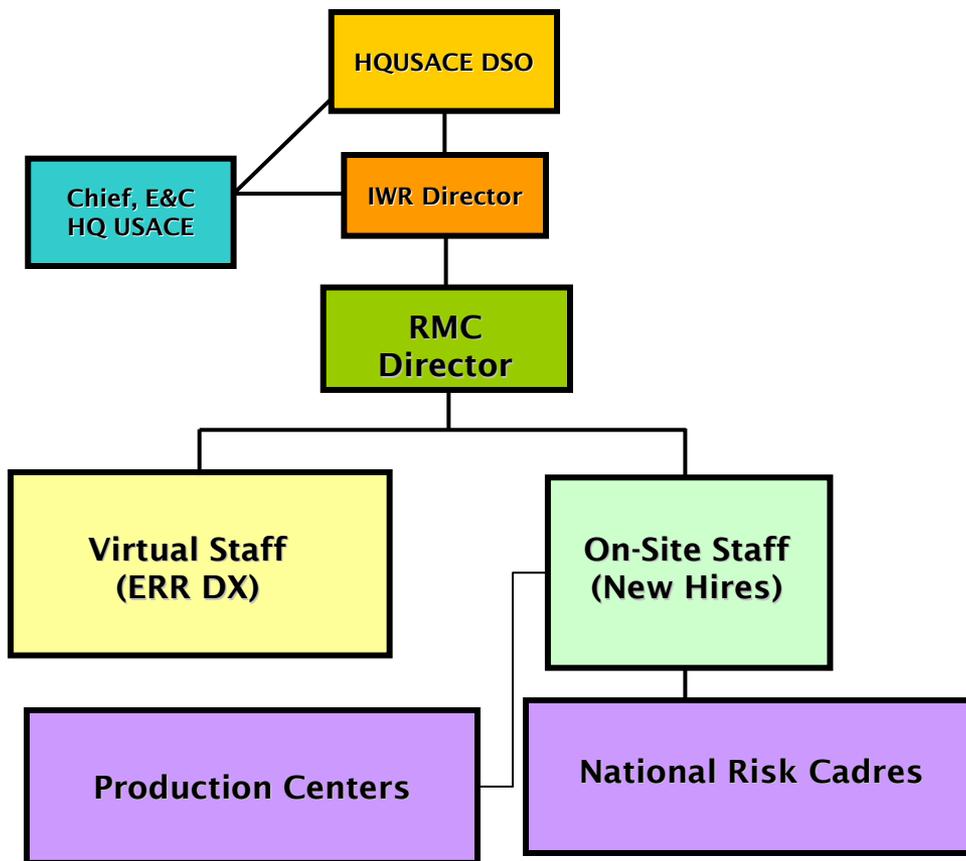
Urgency & Risk Description

Actions Required Description

* At any time for specific events a dam, from any action class, can become an emergency requiring activation of the emergency plan



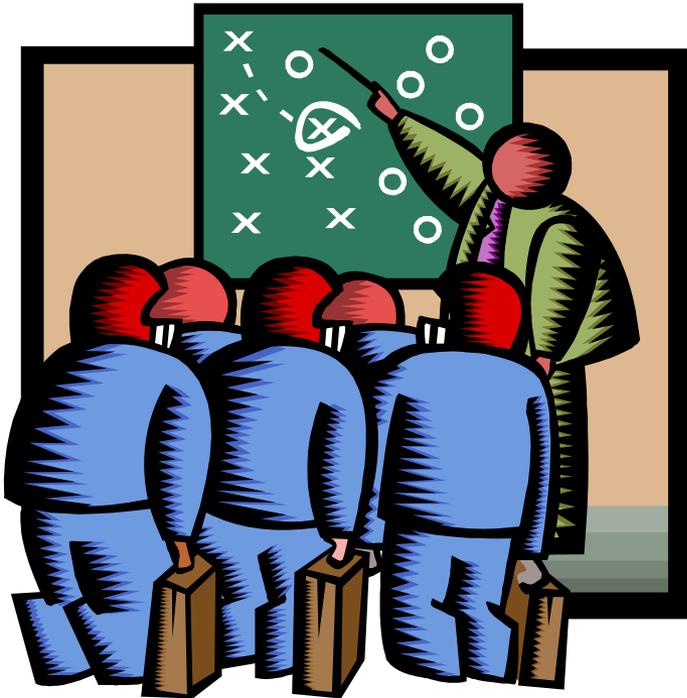
Competency Initiatives



- New Risk Management Center:
 - FOA under IWR
 - On-Site & Virtual Staff (25)
- National Cadres
 - Part-time, Voluntary (75+)
 - Full-time, Competitive (10)
 - Strategic Over-hires with Districts (10)
- Production Centers
 - Mapping, Modeling, and Consequence Estimation



Management Initiatives

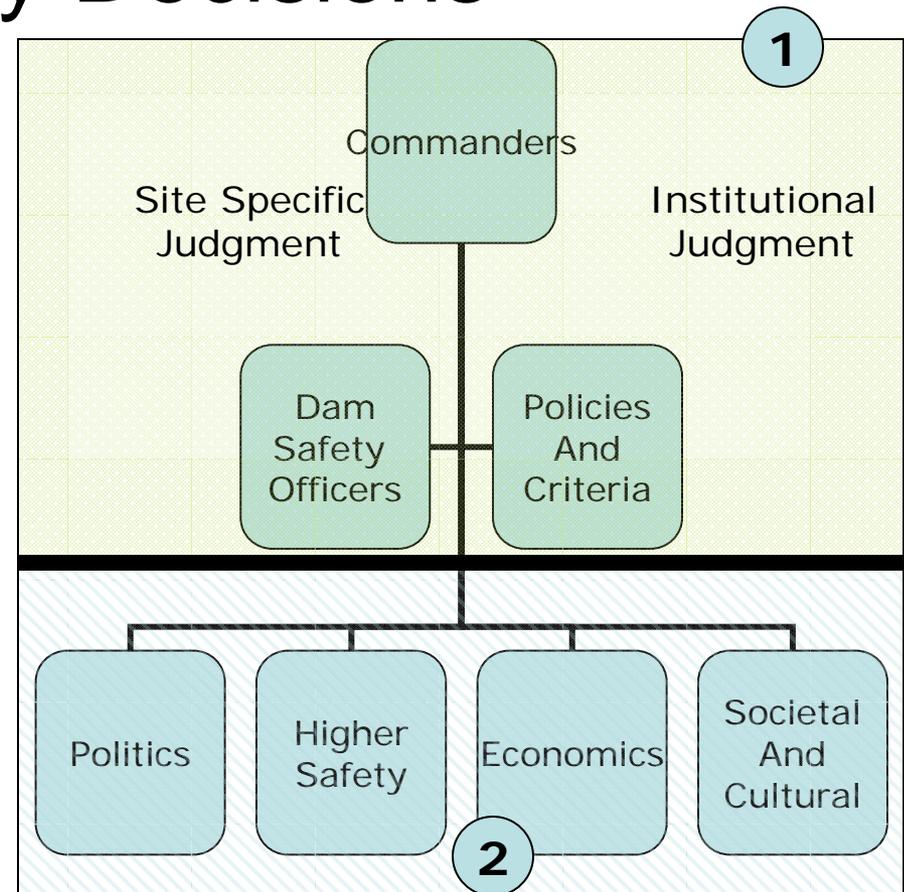


- Leverage PPM Competencies:
 - More Rigor in Dam Safety Studies:
 - P2 Templates
 - PMPs
 - Trained PMs
 - Project Risks
 - Include Dam Safety in Project Review Boards



Roles & Responsibilities: Public Safety Decisions

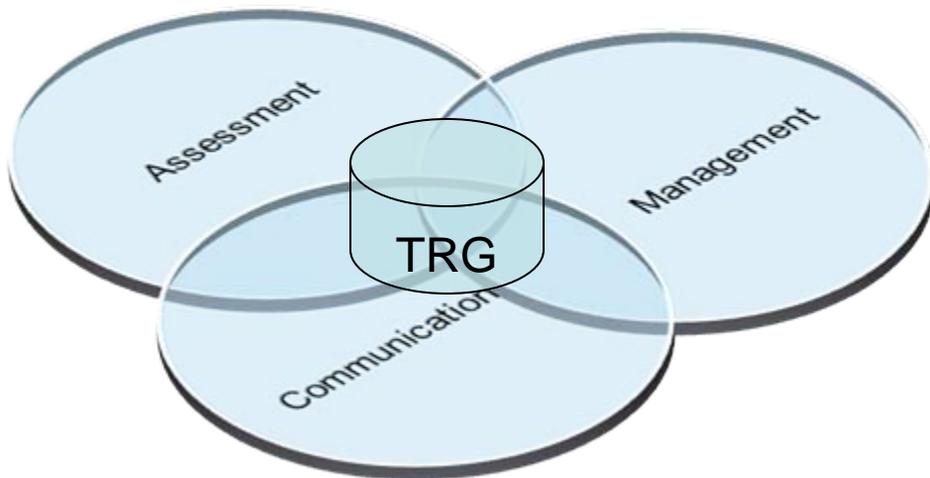
- Commanders:
 - Ultimately Responsible
 - Appoint Safety Officers w/higher HQ Safety Officer Concurrence
- Dam Safety Officers:
 - Make Safety Case First (1)
- DDPMs and PMs:
 - Consider all other aspects: Additional Safety, Political, Economic, Societal, and Cultural Benefits (2)





Policy Initiatives

Tolerable Risk Guidelines



- Assessment:
 - How Safe is Safe?
 - Priority & Urgency
 - What is Tolerable?
- Management:
 - Effectiveness of Interim Measures?
 - What Options are Available?
 - What is Practicable?
 - How Well Justified is Action?
- Communication:
 - How reliable is it?
 - What is Societal Risks?
 - What Risks Remain?



Policy Initiatives

DEPARTMENT OF THE ARMY
U.S. Army Corps of Engineers
Washington, D.C. 20314-1000
EC 1165-2-210

CECW-CP
Circular
No. 1165-2-210
Draft 11 Sep 08

EXPIRES 30 SEPTEMBER 2010
Water Resources Policies and Authorities
WATER SUPPLY STORAGE AND RISK REDUCTION
MEASURES FOR DAM SAFETY

- Purpose.** The purpose of this circular is to establish policy and provide guidance on the impacts of dam safety deficiencies and associated public safety risks, as indicated by the Dam Safety Action Class (DSAC) of a dam, on water supply storage in U.S. Army Corps of Engineers (USACE) reservoirs.
- Applicability.** This circular applies to all USACE commands having Civil Works responsibilities.
- References.**
 - EC 1110-2-6064, Interim Risk Reduction Measures for Dam Safety
 - EC 1110-2-6061, Safety of Dams – Policy and Procedures
 - ER 1105-2-100, Planning Guidance Notebook, Appendix E, Section VIII, "Water Supply"
- Distribution.** Approved for public release; distribution is unlimited.
- Dam Safety Action Classes (DSAC).**
 - The Dam Safety Action Classification process was developed to provide consistent and systematic guidelines for appropriate actions to address dam safety issues and deficiencies of USACE dams. USACE dams are placed into one of five Dam Safety Action Classes (DSAC) based on individual dam safety risk (DSAC I being the highest risk level). DSAC classifications consider event probability, probability of failure, and consequences, given the physical properties of the dam.
 - See reference 3a for the definitions of DSAC classifications and examples of the conditions which determine them.
 - Reference 3a also establishes policies for developing, preparing and implementing Interim Risk Reduction Measures (IRRM) to reduce the probability and consequences of catastrophic dam failure while long-term remediation is pursued.

- Reallocations
 - Limits Water Supply Studies to Safe Dams
 - DSAC IV and V Dams
 - Protects Potential stake holders from Rehab Costs
- IEPR and SARs
 - Virtually All DSAC I, II, and III Dams in Queue



Questions ?

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